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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

DOUGHERTY, THOMAS M

ART UNIT PAPER NUMBER

2834

DATE MAILED: 09/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/431,201

Applicant(s)

SATOH ET AL.

Examiner

Thomas M. Dougherty

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,6,9,11-16 and 22-26 is/are rejected.
- 7) ☒ Claim(s) 2,4,5,7,8,10 and 17-21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 November 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 2/3/03 have been fully considered but they are not persuasive. Regarding claims 11-13, Barr clearly shows the element lacking in Kishi, thus clearly there is no inventive step in implementing that feature in an invention. Regarding the contention that merely by providing an electrical contact on an existing support structure would render the Kishi invention inoperable is simply incorrect. Adding this to the Kishi invention simply relieves the possibility that the electrical conductor may become unintentionally snagged, whether in the making of the device or in the finished product, which has not been refuted by the Applicant. When the combination is effected, this does not mean that the Kishi's components are removed as the Applicants contend in page 3 of their remarks, but simply that this unremarkable feature of Barr, that being providing an electrical conductor in a support member, is a desirable feature to add to Kishi's invention. So the argument that combining renders the device inoperative and the argument that there is no suggestion to combine the references is not persuasive. The Examiner recognizes that references cannot be arbitrarily combined and that there must be some reason why someone skilled in the art would be motivated to make the proposed combination of primary and secondary references. *In re Nomiya*, 184 USPQ 607 (CCPA 1975). However there is no requirement that a motivation to make the modification be expressly articulated. The test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. *In re McLaughlin*, 170 USPQ 209

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(CCPA 1971). References are evaluated by what they suggest to one versed in the art, rather than by their specific disclosures. *In re Bozek*, 163 USPQ 545 (CCPA 1969). In this case the suggestion is as noted above and below in the rejection.

Regarding claim 14, the Applicants indicate that in regards to the "a plurality of piezoelectric members split by a conductive member" that this is not shown in the prior art in any of the prior art documents used in the rejection. However, this is not correct. Massa notes at col. 7 lines 15-25 that electrodes are between his crystals, and of course electrodes are conductive members, and that the electrodes are aligned "parallel to the plane of the base 41". So clearly there is a conductive member between each plurality of piezoelectric members, which is to say, between each adjacent piezoelectric member. Consequently the arguments concerning this feature are not persuasive. Recitation of the visco-elastic members additionally is not explicit. The claim notes their existence through their purpose without ever definitively claiming them. Finally, note that the recitation of application of different voltages is not something that is actually further limiting to the claimed structure since no means to apply the different voltages is claimed.

Regarding claim 25, the Applicants' arguments are not persuasive. The contention that the application of *In re Rose* is not proper in this instance is disputed. Note that Miki uses this additional mass (6) which is visco-elastic to act as "an inertial mass at a low frequencies [sic] to expand the low frequency reproduction and the resonance is suppressed by the vibration absorption of the elastic member at high frequencies." Thus Miki teaches that use of visco-elastic is necessary for frequency

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reproduction, depending on the frequency that it is desirous to reproduce. If a change in size is in order, as noted in the case law, then it is obvious do so.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 14-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The amended description of claim 14 cites that "the plurality of piezoelectric members are split by a conductive member and defined by visco-elastic members provided on at least one face of the piezoelectric vibrator." It is not clear how one component can define another component. These are discrete elements, combined together, how can one define another?

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kishi (US 4,654,554) in view of Barr (US 5,161,200). Kishi shows (fig. 9) a

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piezoelectric loudspeaker comprising: a piezoelectric vibrator including a diaphragm (metal plate) and a piezoelectric member (not numbered) provided on at least one face of the diaphragm, the diaphragm being vibrated by the piezoelectric member; a frame (14) for supporting the piezoelectric vibrator; and a support element (16, 8) for supporting the piezoelectric vibrator at a substantial center of the piezoelectric vibrator. The piezoelectric loudspeaker further comprising a visco-elastic member (7) provided on at least one face of the piezoelectric vibrator.

He fails to show the support element including a conductive portion which is in electrical contact with the piezoelectric vibrator, and an electrical input is applied to the conductive portion. Barr shows (fig. 1) a piezoelectric microphone comprising: a piezoelectric vibrator including a diaphragm (13) and a piezoelectric member (14) provided on at least one face of the diaphragm (13); a frame (5) for supporting the piezoelectric vibrator; and a conductive portion (18) which is in electrical contact with the piezoelectric vibrator, and an electrical input (18) is applied to the conductive portion (15). He doesn't show a loudspeaker per se or a central support. He does not show a support element for supporting the piezoelectric vibrator at a substantial center of the piezoelectric vibrator. It would have been obvious to one having ordinary skill in the art to employ an electrical connection at a central location in the device of Kishi, such as is shown by Barr since this would shorten the wire within the device and lessen the risk of unintentional snags or electrical shorts of the wire.

Claim 14, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Rapps et al. (US 5,446,332) in view of Massa (US 2,427,062). Rapp

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shows (e.g. fig. 6c) a piezoelectric loudspeaker comprising: a piezoelectric vibrator including a diaphragm (3) and a plurality of piezoelectric members (2, 4) provided on at least one face of the diaphragm (3), the diaphragm being vibrated by the plurality of piezoelectric members (2, 4); and, a frame (1) for supporting the piezoelectric vibrator. He does not show a voltage applying means for applying a plurality of voltages; wherein at least two of the plurality of piezoelectric members have a different voltage applied thereto from the voltage applying means. Massa shows (fig. 8) a piezoelectric loudspeaker (col. 6, ll. 70-72) comprising: a piezoelectric vibrator including a base (41) and a plurality of piezoelectric members (45, 46) provided on at least one face of the base (41), the base being vibrated by the plurality of piezoelectric members; and, a frame (36) for supporting the piezoelectric vibrator wherein the plurality of piezoelectric members are split by a conductive member. He shows a voltage applying means (electrical leads) for applying a plurality of voltages; wherein at least two of the plurality of piezoelectric members have a different voltage applied thereto from the voltage applying means. See claim 8 especially where it is clearly stated that the voltages applied to the piezoelectric elements differ. Massa does not show a component that can be construed as a diaphragm. It would have been obvious to one having ordinary skill in the art to have the ability for applying a plurality of at least two voltages to the invention of Rapps et al. as is taught by Massa since this would make the device more versatile in its output.

Claims 14 and 15, as best understood, are rejected under 35 U.S.C. 103(a) as being anticipated by Miki (JP 3-175800) in view of Massa (US 2,427,062). Miki shows

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(figs. 1a and 1b) a piezoelectric loudspeaker comprising: a piezoelectric vibrator including a diaphragm (2) and a plurality of piezoelectric members (1) provided on at least one face of the diaphragm (2), the diaphragm being vibrated by the piezoelectric members (1); and, a frame (5) for supporting the piezoelectric vibrator. The device further comprising a visco-elastic member (6) provided on at least on face of the piezoelectric vibrator and a conductor (2, the Nickel alloy plate) between his piezoelectric elements (1). He does not show a voltage applying means for applying a plurality of voltages; wherein at least two of the plurality of piezoelectric members have a different voltage applied thereto from the voltage applying means. Massa shows (fig. 8) a piezoelectric loudspeaker (col. 6, ll. 70-72) comprising: a piezoelectric vibrator including a base (41) and a plurality of piezoelectric members (45, 46) provided on at least one face of the base (41), the base being vibrated by the plurality of piezoelectric members (2, 4); and, a frame (36) for supporting the piezoelectric vibrator. He shows a voltage applying means (electrical leads) for applying a plurality of voltages; wherein at least two of the plurality of piezoelectric members have a different voltage applied thereto from the voltage applying means. See claim 8 especially where it is clearly stated that the voltages applied to the piezoelectric elements differ. Massa does not show a component that can be construed as a diaphragm. It would have been obvious to one having ordinary skill in the art to have the ability for applying a plurality of at least two voltages to the invention of Miki et al. as is taught by Massa since this would make the device more versatile in its output.

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Claim 16, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Miki (JP 3-175800) and Massa (US 2,427,062) in view of Kitanishi (US 5,321,761). Given the combined invention of Miki and Massa as noted above, said combination doesn't show the input to at least one of the plurality of piezoelectric members as being via an electrical resistance. Kitanishi shows (figs. 2 and 7) a piezoelectric sound generator comprising: a piezoelectric vibrator including a diaphragm (20) and a piezoelectric member (21) provided on at least one face of the diaphragm (20), the diaphragm being vibrated by the piezoelectric member (21); and, a frame for supporting the piezoelectric vibrator. He notes (fig. 7) the input to the piezoelectric member as being via an electrical resistance (e.g. 4). He doesn't show a plurality of piezoelectric members and his device is not a loudspeaker. It would have been obvious to one having ordinary skill in the art to apply to the input of at least one of the plurality of piezoelectric members of Miki's and Massa's combined device as being via an electrical resistance in order to reduce the chance that an overvoltage is applied, thereby preventing damage to the device.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miki (JP 3-175800). Miki shows (figs. 1a, 1b) a piezoelectric loudspeaker (see title) comprising: a piezoelectric vibrator including a diaphragm (2) and a piezoelectric member (1) provided on at least one face of the diaphragm (2); a frame (5) for supporting the piezoelectric vibrator; and a visco-elastic member (6) provided on at least one face of the piezoelectric vibrator, wherein the visco-elastic member (6) is disposed in a substantial center of the piezoelectric vibrator, and wherein the visco-elastic member

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has a bottom face area (determined by sight) which accounts for about 11% to 80% of a bottom face area of the diaphragm (2). He further shows a diameter of the visco-elastic member being smaller than the inner diameter of the frame but he doesn't show the bottom face area of the visco-elastic member as being equal to or greater than the bottom face area of the piezoelectric member or covering an entire upper face of the piezoelectric member. It would have been an obvious matter of design choice to so size the visco-elastic member since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 2377 (CCPA 1955).

Allowable Subject Matter

Claims 1, 2, 5-10, 18-24, 26 and 27 are allowed.

Conclusion

This action is made final. See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136 (a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Direct inquiry concerning this action to Examiner Dougherty at (703) 308-1628.

tmd
tmd

October 22, 2002

Examiner M. Dougherty